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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,608	07/23/2003	Gianluca Bollito	Q76067	7606

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EXAMINER	
LEE, CYNTHIA K	

ART UNIT	PAPER NUMBER
1745	

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07/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/624,608	BOLLITO ET AL.	
	Examiner	Art Unit	
	Cynthia Lee	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-23 and 31-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-23 and 31-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/16/2007 has been entered.

Response to Amendment

This Office Action is responsive to the amendment filed on 4/16/2007. Claim 33 has been added. Claims 1, 3-23, 31-33 are pending.

The 35 USC 112, 2nd rejection has been withdrawn.

Applicant's prior art arguments have been considered. After further consideration by the Examiner, claims 1, 3-23, 31-33 are rejected for reasons stated herein below.

Claims Analysis

Claim 1 and 11 were considered to have invoked the 35 USC 112 6th paragraph as supported by the description of the conducting path on pg. 8 of the specification.

Claims 6 and 7 were considered to have not invoked the 35 USC 112 6th paragraph because the "means plus function" has been sufficiently modified by structural limitations.

The limitation "made using MEMs technology" has been considered but was not given patentable weight because the courts have held that the method of forming the

product is not germane to the issue of patentability of the product itself. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-9 11, 12, 22, 23, 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pan (US 2002/0182475) in view of Maynard (US 6541149).

Pan discloses a fuel cell having a first electrode, a second electrode, and an electrolyte arranged between the first and the second electrode. The assembly is made of a plurality of layers on a flexible substrate. Pan discloses a plurality of cells on the same flexible substrate (fig. 3 and 4). The flexible substrate is Kapton ®.

A first layer of metallic material rests on the flexible substrate and the first electrode comprises an anode catalyst. A second layer of metallic material rests on the electrolyte and the second electrode comprises a cathode catalyst. See fig. 2. A protective layer is present on both sides of the metallic substrate made of Kapton ®. The electrolyte is made from Nafion ®. The means for conducting electrical current to the first electrode and the second electrode are in the form of metallic layers. The catalyst comprises platinum, ruthenium, and osimium [0015]. Conducting paths that electrically connect each cell to the next one is necessarily present for the series of fuel cell to operate. Pan discloses that the flexible substrate is in the form of a ribbon

developing in length and is rolled up. See fig. 4. The fuel is methanol in aqueous solution [0031].

Pan does not disclose that the structure is miniaturized. However, Maynard teaches of forming a micro fuel cell for portable electrical devices. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to miniaturize Pan's fuel cell for the benefit of using it for portable electrical devices. Further, it has been held that a modification that would have involved a mere change in the size of a component is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (1955).

Pan discloses delivery mean for delivering a fuel cell to each cell and discharge means for emptying water from each cell. The methanol fuel is delivered through the openings 112 (applicant's duct) in the flex substrate and by the porous material layers to the catalytic sites [0026]. Pan discloses that the liquid fuel supplies all portions of the fuel cell. The pores in the porous metal layer may be oriented in the local plane, or substantially in the local plane defined by the flexible substrates (applicant's claim 33). The pores may be further oriented such that liquid fuel will be transported in a specified direction within the pores metal layer so that liquid fuel reaches all, or substantially all, of the fuel side flex circuit [0031]. Thus, the duct 112 connects the fuel cells to each other (applicant's claim 1).

Claims 10 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pan (US 2002/0182475) and Maynard (US 6541149) as applied to claim 1 above and incorporated herein, and further in view of Narayanan (US 6432284).

Pan as modified by Maynard teaches all the elements of claim 1. Pan as modified by Manard does not teach that the electrolyte has a composite structure comprising Nafion ® and zeolite. However, Narayanan teaches that Nafion coated with zeolite changes the permeability of Nafion ® and thus, can be used to reduced the crossover of methanol (9:10-20). Since Pan discloses of using methanol as fuel [0026], it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Pan and Maynard's fuel cell with Narayanan's Nafion ® electrolyte coated with zeolite for the benefit of reducing methanol crossover. Since zeolite imparts methanol reducing capabilities, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add zeolite to the electrode as well for the benefit of further reducing methanol crossover. Pan, Maynard, Narayanan are closely related to applicant's field of endeavor of power generating device using electro-oxidation and electro-reduction.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pan (US 2002/0182475) and Maynard (US 6541149) as applied to claim 1 above and incorporated herein, and further in view of Hinokuma (US 2003/0013003).

Pan modified by Maynard teaches all the elements of claim 1. Pan modified by Maynard does not teach that the catalyst contains carbon materials. However,

Hinokuma teaches that fullerene catalyst exhibits superior current density and output characteristics [0018]. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Pan and Maynard's fuel cell with fullerene catalyst for the benefit of improving the current density and output characteristics.

Claims 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pan (US 2002/0182475) and Maynard (US 6541149) as applied to claim 1 above and incorporated herein, and further in view of Shiue (US 6500575).

Pan modified by Maynard teahces all the elements of claim 1. Pan modified by Maynard does not teach a control system comprising a micro pump, a microcontroller, and a supercapacitor. However, Shiue teaches a battery with a control system to control air flowing through the batteries. Shiue teaches a piezoelectric micro pump to pump the air through the battery (5:20-50). The system further comprises a supercapacitor as an energy storage device (3:10-20). The system further comprises a control network (5:50-55). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a control system to Pan and Maynard's fuel cell for the benefit of controlling/ regulating the system, such as air, fuel, and water. Shiue is closely related to Pan, Maynard, and applicant's field of endeavor of fuel cells because metal-air batteries are one type of fuel cells.

Response to Arguments

Applicant's arguments filed 4/16/2007 have been fully considered but they are not persuasive.

Applicant asserts that Pan discloses two flexible substrates supported face-to-face and instant claim 1 recites that the entire structure of each cell is associated with a single flexible substrate.

Instant claim 1 is written in open language ("comprising") and thus, still reads on Pan's two flexible substrates.

Applicant asserts openings 112 do not connect the cells with each other.

This argument has been addressed in the rejection above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ckl

Cynthia Lee

Patent Examiner

SUSY TSANG-FOSTER
PRIMARY EXAMINER